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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,074	07/19/2001	Joyce S.Oey Hewett	2000.075200/TT4629	9763

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EXAMINER
NGUYEN, KHIEM D

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 10/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/909,074	Applicant(s) HEWETT ET AL.
	Examiner Khiem D Nguyen	Art Unit 2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) *16-41* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of claims 1-15 in Paper No. 3 is acknowledged. The traversal is on the ground(s) that, see the traverse. This is not found persuasive because inventions of method group (I) and apparatus group (II) have different classifications so the searches are non-coextensive. Further, the examiner has shown that the apparatus as claimed can be used to practice another and materially different process such as one in which the method recited in Claim 16 specifically requires that the apparatus is used to measure and deposit a conductive layer, the same apparatus can be used in forming an insulator. See the restriction.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (U.S.P.A.P 2002/0032499) in view of Shimada et al. (U.S. Patent 6,436,265).

Wilson teaches a method of controlling a conductive layer deposition process comprising (See page3, paragraph [0025] and FIGS. 1 and 4):

depositing a conductive layer such as copper above a first semiconductor wafer based upon a deposition recipe (See page 1, paragraphs [004] and [0008] and page 7, paragraph [0061]);

measuring a thickness of the conductive (copper) layer deposited on the semiconductor wafer and determining whether the measured thickness of the conductive (copper) layer is within a predetermined tolerance 76 (See page 5, paragraph [0042] and FIG. 4); and,

revising the deposition recipe according to at least one predetermined model if the measured thickness of the conductive (copper) layer is not within the predetermined tolerance 78 (See page 5, paragraph [0042] and FIG. 4);

Wilson fails to teach wherein revising the deposition recipe further comprises revising at least one parameter selected from the group consisting of an electroplating bath temperature, a chemical concentration of an electroplating bath, an anode-cathode spacing, an anode power setting and an electroplating deposition time as recited in present claim 3.

Shimada teaches that the thickness of the electroplated layer can be control by revising the electroplating deposition time and electroplating bath temperature. See col. 10, lines 63-67. ***It would have been obvious to one of ordinary skill in the art of making semiconductor devices*** to incorporate Shimada's teaching into Wilson's method in order to revise the deposition recipe so that a smooth surface layer can be obtained. See col. 10, lines 44-50.

Wilson teaches using the newest parameter derived in step 80 (FIG. 4) in processing subsequent microelectronic workpieces (paragraph [0042]) but fails to explicitly teach depositing a conductive layer above a second semiconductor wafer based upon the revised deposition recipe as recited in present claim 4. However, ***it would have been obvious to one of ordinary skill in the art of making semiconductor devices*** to apply Wilson's method to deposit a conductive layer above a second semiconductor wafer based upon the revised deposition recipe.

3. Claims 6-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (U.S.P.A.P 2002/0032499) in view of Shimada et al. (U.S. Patent 6,436,265).

Wilson teaches a method of controlling a conductive layer deposition process comprising (See page3, paragraph [0025] and FIGS. 1 and 4):

depositing a conductive layer such as copper above a first semiconductor wafer based upon a deposition recipe (See page 1, paragraph [004] and [0008] and page 7, paragraph [0061]);

measuring a thickness of the conductive (copper) layer at a plurality of predetermined pattern of locations (See page 7, paragraph [0061] and Table 1) and calculating a value representing the measured thickness comprises calculating an average (arithmetic mean) of the plurality of thickness measurements (See page 9, paragraph [0088]) then determining whether the calculated value is within a predetermined tolerance 76 comprises calculating a measure of a degree of dispersion of the plurality of thickness measurements about the calculated value and comparing the measure of the degree of dispersion to a predetermined statistical distribution selected from the group

consisting of the standard deviation (normal distribution) (See page 9, paragraphs [0088] and [0091] and page 5, paragraph [0042] and FIG. 4); and,

revising the deposition recipe based upon at least the calculated value if the calculated value is not within the predetermined 78 (See page 5, paragraph [0042] and FIG. 4);

Wilson fails to teach wherein revising the deposition recipe further comprises revising at least one parameter selected from the group consisting of an electroplating bath temperature, a chemical concentration of an electroplating bath, an anode-cathode spacing, an anode power setting and an electroplating deposition time as recited in present claim 14.

Shimada teaches that the thickness of the electroplated layer can be control by revising the electroplating deposition time and electroplating bath temperature. See col. 10, lines 63-67. ***It would have been obvious to one of ordinary skill in the art of making semiconductor devices*** to incorporate Shimada's teaching into Wilson's method in order to revise the deposition recipe so that a smooth surface layer can be obtained. See col. 10, lines 44-50.

Wilson teaches using the newest parameter derived in step 80 (FIG. 4) in processing subsequent microelectronic workpieces (paragraph [0042]) but fails to explicitly teach depositing a conductive layer above a second semiconductor wafer based upon the revised deposition recipe as recited in present claim 15. However, ***it would have been obvious to one of ordinary skill in the art of making semiconductor devices*** to

apply Wilson's method to deposit a conductive layer above a second semiconductor wafer based upon the revised deposition recipe.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D Nguyen whose telephone number is (703) 306-0210. The examiner can normally be reached on Monday-Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-9179 for regular communications and (703) 746-9179 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

K.N.
September 29, 2002

LONG PHAM
PRIMARY EXAMINER